

Los Alamos National Laboratory
Environmental Restoration Program
Standard Operating Procedure

No: LANL-ER-SOP-03.10

Rev: 0

Trenching and Logging

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Effective Date:

May 19, 1993

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Trenching and Logging

1.0 PURPOSE

This procedure describes general methods for trenching and logging of trenches for characterization of geologic units or geologic structure.

2.0 SCOPE

2.1 Applicability

This procedure is applicable to all personnel conducting trench excavation and trench logging for the Environmental Restoration (ER) Program for the purposes of geologic characterization.

2.2 Training

The investigation team should be composed of technical specialists with backgrounds in the field of geology. In addition, all personnel using this procedure for the ER Program must certify that they have read and understand this procedure.

3.0 DEFINITIONS

There are no unique definitions in this procedure.

4.0 BACKGROUND AND/OR CAUTIONS

Trenches are open excavations with generally vertical sides, and precautions are required to ensure the safety of workers. Shoring is required for trenches deeper than 5 feet when the trench is excavated in material susceptible to collapse, and ladders are required to provide exits for site workers. A minimum of two people must be present at the site before entry, and all personnel entering trenches must be equipped with hard hats and steel-toed safety shoes. OSHA Publication 2226, Excavation and Trenching Operations, should be reviewed prior to start-up.

5.0 EQUIPMENT

Equipment to be used in trench activities include standard geologic and surveying tools, such as the following:

- Geologic hammer
- Pick
- Knife
- Brunton compass
- Hand lens

- Notebook
- Total station, theodolite, or transit
- Stadia rod or surveying prism

6.0 PROCEDURE

Trenching may be used to document the presence or absence of faults or other geologic structures, and to help evaluate the potential for surface rupture and the frequency and amount of such displacement. Trenches may also be used to evaluate other geologic features such as soils or stratigraphy.

Geologic features such as stratigraphy, faults, fractures, and related structures will be logged in detail. This will allow the geologic relationships and sample locations to be permanently recorded and to be available for later analysis

6.1 Trench Locations

Trench locations shall be determined on the basis of field mapping and analysis of aerial photographs. Sites will be selected based on the requirements of the project, such as the potential for providing data on fault location and fault history, stratigraphic units, or soils.

Location control at trenches shall be done using either a digital total station or hand-surveying methods. The locations will be tied to topographic maps and/or aerial photographs.

6.2 Trench Dimensions

The minimum trench dimensions sufficient to expose significant geologic materials and relationships on the trench wall are generally 5 to 12 feet deep by 3 feet wide. The actual dimensions may vary depending on site and geologic conditions and available equipment. Trenching will also vary considerably depending on topography, ease of excavation, and available equipment.

6.3 Trench Wall Preparation

The sides of the trench shall be cleaned by chipping or scraping continuously so as to expose a clean face of rock, sediment, or soil.

6.4 Logging Scale

The choice of scale will be at the discretion of the project geologist and will depend on the complexity of geologic structures revealed in the trench. The normal scale for detailed logging is 1 inch equals 1 to 2 feet. Justification for scales other than these shall be documented.

6.5 Logging Procedures

Logging procedures shall consist of making a vertical profile parallel to one trench wall using a natural scale, with no vertical exaggeration. Contacts between geologic units shall be drawn on the profile and units identified and described as considered appropriate by the project geologist. Characteristics and types of contacts shall be noted.

6.6 Stratigraphic and Lithologic Variations

Variations within the geologic units will be described and indicated on the trench log whenever the variation occurs.

6.7 Photography

After the trench is logged, the shoring, if used, will be removed and the trench may be photographed at the discretion of the project geologist.

6.8 Other Notations

Sample locations shall be shown in the trench log and their locations written on a sample tag showing the trench station. All sample locations should be referenced to trench stationing.

7.0 REFERENCES

OSHA Publication 2226, Excavation and Trenching Operations, U.S. Department of Labor

LANL-ER-AP-02.1, Procedure for LANL ER Records Management

8.0 RECORDS

The results of the trenching activities shall be presented in a report, and this report will serve as a record of these activities. The report will include the following:

- a map or maps showing trench locations,
- detailed trench logs,
- descriptions of geologic units and structures exposed in the trenches, and
- interpretation of the trench logs with respect to the project goals

Records will be transferred to the ER Records Processing Facility in accordance with the Procedure for LANL ER Records Management (LANL-ER-AP-02.1).

9.0 ATTACHMENTS

N/A